

CLAIMS:

1. An ultra-wideband (UWB) network comprising a plurality of UWB devices each forming a node of said network, pairs of said UWB devices being configured for communication with one another using one of a plurality of UWB channels, each said UWB device comprising:

a UWB transceiver for bidirectional communication over one or more of said UWB channels with at least one other of said UWB devices; and

a device controller coupled to said UWB transceiver, said controller being configured to determine a said UWB channel for use in establishing a communication link with each other UWB device;

whereby said network is configured for automatic construction of a set of communications links between said nodes of said network.

2. A UWB network as claimed in claim 1 wherein said UWB transceiver of each said UWB device is configured for bidirectional communication with a plurality of other UWB devices over a plurality of said channels, and wherein said device controller of each said UWB device is further configured to store connection data associating a first of said channels bearing incoming data with a second of said channels for use in forwarding said incoming data to another of said UWB devices.

3. An ultra-wideband (UWB) network comprising a plurality of UWB devices each forming a node of said network, pairs of said UWB devices being configured for communication with one another using one of a plurality of UWB channels, each said UWB device comprising:

a UWB transceiver for bidirectional communication over a plurality of said UWB channels with a plurality of other UWB devices; and

a connection table configured to store connection data associating a first of said channels bearing incoming data with a second of said channels for use in forwarding said incoming data to another of said UWB devices.

4. A data packet for UWB communication between nodes of a packet data UWB network, in particular as claimed in claim 1, 2 or 3, the network having a plurality of UWB channels for communication between said network nodes, said data packet including payload data and UWB channel identification data, whereby a said network node receiving said data packet is able to determine a UWB channel to use when forwarding said data packet.
5. A data packet as claimed in claim 4 further comprising destination identification data.
6. An ultra-wideband (UWB) device for a node of a UWB network, the device comprising:
 - an interface to a UWB transceiver for bidirectional communication over one or more UWB channels with one or more other UWB devices; and
 - a controller coupled to said UWB transceiver interface, said controller being configured to control said UWB transceiver to communicate with said one or more other UWB devices to determine a said UWB channel to employ for communicating with each of said other UWB devices.
7. A UWB device as claimed in claim 6 wherein said controller is configured to control said UWB transceiver to broadcast a connection request to request a connection to a selected one of said one or more other UWB devices, to receive a connection response from said selected UWB device, and to determine a said UWB channel to employ for communicating with said selected UWB device responsive to said connection response.
8. A UWB device as claimed in claim 7 wherein said determined channel comprises a channel on which said connection response is received.
9. A UWB device as claimed in claim 7 or 8 further comprising a connection table for storing connection data, said connection data comprising data associating said selected UWB device with said determined channel.

10. A UWB device as claimed in claim 9 for communicating with a plurality of other UWB devices, communication with at least one indirectly linked device of said other UWB devices being via an intermediary UWB device, and wherein said connection data for said indirectly linked UWB device comprises data associating said indirectly linked device with a channel for communicating with said intermediary device.

11. A UWB device as claimed in any one of claims 6 to 10 wherein said UWB transceiver is configured for bidirectional communication with a plurality of other UWB devices over a plurality of said channels, and wherein said controller is further configured to store connection data associating a first of said channels bearing incoming data with a second of said channels for use in forwarding said incoming data to another of said UWB devices.

12. A UWB device as claimed in claim 11 further comprising a data store to store said incoming data for forwarding.

13. A UWB device as claimed in claim 11 or 12 configured to receive and forward said incoming data, and wherein said controller is configured to control said transceiver to reply to a sender of said incoming data with a connection disconnect message where a recipient for incoming data is not found.

14. A UWB device as claimed in any one of claims 6 to 10 wherein said controller is further configured to control said transceiver to broadcast an alert to said one or more other UWB devices on initiation of said UWB device.

15. A UWB device as claimed in claim 14 wherein said alert comprises an identifier for said broadcasting device, and wherein said controller is further configured to receive a response to said alert and, responsive to said response, to modify said device identifier.

16. A UWB device as claimed in any one of claims 7 to 15 wherein said controller is further configured to receive a said connection request and respond with a said connection response.

17. A UWB device as claimed in claim 16 wherein a said connection request includes communication quality data, and wherein said controller is further configured to receive a plurality of said connection requests, to compare said quality data for said connection requests, and to respond to selected said request responsive to said comparison.

18. A UWB device as claimed in any one of claims 6 to 17 including said UWB transceiver.

19. A controller for controlling a UWB device for a node of a UWB network, the UWB device including a UWB transceiver for bidirectional communication over one or more UWB channels with a plurality of other network devices, communication with at least one indirectly linked device of said other UWB devices being via an intermediary UWB device, the controller comprising;

an interface for said UWB transceiver;

data memory for storing network communication link connection data

comprising data associating each said network device with a said UWB channel;

program memory storing computer program code; and

a processor coupled to said interface, said data memory, and to said program memory for loading and implementing said program code;

wherein said connection data for said indirectly linked UWB device comprises data associating said indirectly linked device with a channel for communicating with said intermediary device; and

wherein said code comprises code to send network data to said indirectly linked device by accessing said connection data for said indirectly linked device to determine said channel associated with said intermediary device, and controlling said UWB transceiver to transmit said network data over said determined channel.

20. A controller for an ultra-wideband (UWB) network node, the controller comprising:

- a processor having a processor control bus and a processor data bus;
- processor memory coupled to said processor data bus;
- buffer memory coupled to a second data bus;
- a memory access controller coupled to said second data bus and to said

processor control bus; and

- a UWB interface for interfacing to a UWB communications device, coupled to said processor control bus and to said second data bus; and

- wherein said processor is master of said processor control bus and said memory access controller is master of said second data bus.

21. A UWB network having a mesh topology and comprising a plurality of UWB devices configured for mutual UWB communication with one another, a first of said devices being configured for communicating with a second of said devices via a third of said devices when said second device is out of range, and wherein said third device is configured to use a first UWB communication channel for communicating with said first UWB device and a second UWB communication channel for communicating with said second UWB device.

22. A method of sending data from a first data processor to a second data processor in a network of data processors having a variable network topology, said topology being defined by communications links between processors of said network, the method comprising:

- broadcasting a connection request message from said first processor to substantially all other processors to which it is linked;

- receiving a connection established message from said second data processor via an intermediary processor with which said first processor is linked; and

- sending said data to said intermediary processor for forwarding to said second processor.

23. A method as claimed in claim 22 wherein said first and second processors are linked by a plurality of intermediary processors, wherein each of said intermediary

processors receives and rebroadcasts said connection request, and wherein said connection established message propagates through each of said intermediary processors in turn to form a chain of processors to establish a chained connection, and wherein said sending sends said data over said chained connection.

24. A method as claimed in claim 23 wherein each said communications link uses at least one of a plurality of communications channels, the method further comprising storing, at a said intermediary processor, a table linking an incoming data channel to an outgoing data channel to define a said chained connection.

25. A method as claimed in claim 24 further comprising sending a chain broken message from a said intermediary processor to said first processor when said intermediary processor is unable to forward said data.

26. A method as claimed in any one of claims 22 to 25, further comprising broadcasting an alert message, including an identifier for said second processor, from second processor substantially throughout said network, and wherein said connection request message includes said second processor identifier.

27. A method as claimed in any one of claims 22 to 26 wherein said network comprises a network having a mesh topology, and wherein said communications links comprise ultra wideband (UWB) communications links.

28. Processor control code to, when running, implement the method of claim 22.

29. A carrier carrying the processor control code of claim 28.

30. A network communications device including a processor and the carrier of claim 29.